NASA Facts

National Aeronautics and
Space Administration

NASA Headquarters
Public Affairs Office
Code P
300 E Street SW
Washington, DC 20546

FS-2000-01-012-HQ

Spinoffs from the Space Program

From the frontiers of Mars to the halls of medicine. From the spacecraft of Apollo to your kitchen sink. Technologies developed for NASA's satellites, avionics systems, and spacecraft have come back to Earth to spawn new industries and improve the quality of people's lives. Some of NASA's major contributions are:

- **Breast Cancer Screening**—An advanced digital sensor that detects infrared energy has been incorporated in a noninvasive diagnostic tool that screens for breast cancer.

- **Breast Biopsy**—A non-surgical and much less traumatic breast biopsy technique, based on technology developed for NASA's Hubble Space Telescope, is now saving women time, pain, scarring, radiation exposure, and money.

- **Computer-Aided Tomography and Magnetic Resonance Imaging**—Used in hospitals worldwide, these diagnostic tools came from technology developed to computer-enhance pictures of the Moon for the Apollo program.

- **Cool Suits**—Worn by Apollo astronauts to stay comfortable during Moon walks, these suits today are used by race car drivers, nuclear reactor technicians, shipyard workers, people with multiple sclerosis and kids with a congenital disorder known as hypohidrotic ectodermal displasia.

- **Cordless Power Tools and Appliances**—One of the most successful commercial spinoffs of space-based technology, these re-chargeable tools were developed to permit astronauts to do repairs in space.

- **Cardiac Pacemaker**—First developed in the 1970's using NASA satellite electrical systems technology, the fourth generation of this unit incorporates space communications telemetry for noninvasive communication with the implanted pacemaker, as well as longer-life batteries from technology for spacecraft electrical power systems.

- **Fetal Heart Monitor**—Technology originally used to measure airflow over aircraft wings has been used to develop a more affordable, portable, non-invasive, easy-to-use fetal heart monitor.

- **Firefighting Equipment**—In response to concerns from the Nation's fire chiefs, NASA designed a lighter, smaller, self-contained breathing apparatus that gave firefighters more mobility while working in smoke-filled structures.

- **Heart Pump**—The technology used in Space Shuttle fuel pumps led to the development of a miniaturized ventricular assist pump by NASA and renowned heart surgeon Dr. Michael DeBakey. The tiny pump—two inches long, one inch in diameter and weighing less than four ounces—is currently under going European clinical trials.

- **Kidney Dialysis**—Kidney dialysis machines were developed as a result of a NASA developed chemical process that could remove toxic waste from used dialysis fluid.

- **Insulation**—Insulation barriers made of aluminum foil laid over a core of propylene or mylar, which protected astronauts and their spacecraft's delicate instruments from radiation, is used to protect cars and trucks and dampen engine and exhaust noise.

- **Insulin Pumps**—Implantable and external insulin pumps, which is based on a design of the biological laboratory of the Mars Viking spacecraft, have aided insulin dependent diabetics. These computerized pumps can infuse insulin at a pre-programmed rate, allowing more precise control of blood sugar levels.

- **Temperature Pill**—An ingestible thermometer capable of accurately measuring and relaying deep internal body temperatures non-invasively to an external receiver was developed from satellite communication techniques.

- **Surgical Probe**—Special lighting technology developed for plant growth experiments on Space Shuttle Spacelab missions is now used to treat brain tumors in children. Doctors at the Medical College of Wisconsin in Milwaukee use light emitting diodes in a treatment called photodynamic therapy, a form of chemotherapy, to kill cancerous tumors.

- **Water Purification**—Water purification technology used on the Apollo spacecraft is employed in several spinoff applications to kill bacteria, viruses and algae in community water supply systems and cooling towers. Filters mounted on faucets can reduce lead in water supplies.

For more information on NASA Spinoffs, please refer to our Web site at: ***http://nctn.hq.nasa.gov/success/index.html***